- Meeting Summary-

March 3, 2011 - (9:30 a.m. – 5:00 p.m., PST)

1. Welcome

The meeting was called to order at 9:30 a.m., March 3, 2011, by the Chair of the Delta Independent Science Board (Delta ISB), Dr. Richard Norgaard. Seven members of the Delta Independent Science Board were present: Brian Atwater, Tracy Collier, Michael Healey, Judy Meyer, Jeffrey Mount, Richard Norgaard, and John Wiens. One member was on the call for the meeting: Elizabeth Canuel. Vince Resh and Edward Houde were absent from the meeting.

Norgaard welcomed participants, and asked present members of the Delta ISB if there were any new disclosures to report. Only Atwater and Wiens had any changes to report regarding disclosures, all others remained the same as previously reported.

New Disclosures:

> ***Atwater and Wiens:*** Both members had the same potential conflict of interest which involved being listed as key advisors on a grant proposal being prepared by the San Francisco Estuary Institute in response to a solicitation made by the California Department of Fish and Game. Both will excuse themselves from the proposal if it is determined that a potential conflict exists.

Delta Science Program Staff in attendance: Marina Brand, Lauren Hastings, and Gina Ford.

2. Lead Scientist Report

The Lead Scientist report was presented by Lauren Hastings, Deputy Executive Officer of the Delta Science Program for Dr. Cliff Dahm, Lead Scientist for the Delta Science Program. Items discussed included:

- The Interagency Ecological Program (IEP) is having their Annual Workshop this month, on March 30, 2011.
- Thirteen proposals (approximately $7.1 million) have been selected for funding as a result of the 2010 Proposal Solicitation. Dahm will be requesting funding approval from the Delta Stewardship Council at its March 24-25, 2011 public meeting.
- The U.S. Environmental Protection Agency has released an "Advance Notice of Proposed Rulemaking—February 10, 2011 Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary." The Delta Science Program will be commenting on this proposed rulemaking.

- The Science and Adaptive Management Chapter (Chapter 4) of the first staff draft of the Delta Plan was released on March 2, 2011. This chapter was prepared by Delta Science Program staff and contains a more simplified version of the adaptive management framework contained in the BDCP.
- The Delta Science Program is still understaffed, with two vacant positions. The workload consists primarily of supporting the Delta ISB and contributing to staff drafts of the Delta Plan.
- Staff has organized a Salmonid Life Cycle Models Workshop scheduled for April 13, 2011.

Public comment on this agenda item provided by:
Steve Baker, Living Water Alliance: Baker began to make some general statements about the Delta and was asked by Chair Norgaard to please hold his comments until the end of the day when there is public comment for items not on the agenda. It was explained to Baker that public comment during specific agenda items are for comments related to that item only.

3. Status Update: Delta Plan

This agenda item was presented by Joe Grindstaff, Executive Officer of the Delta Stewardship Council; in particular Grindstaff noted the following:

- The intent of the Findings is to help make decisions about potential actions. Several specific Findings were discussed that need to be made more "actionable." These included:
    - Over pumping groundwater
    - The fact that the Delta has become increasingly variable
    - The probability that not all species are likely to survive
    - There is no state plan for flooding in the Delta
    - Additional conveyance should be promoted either as part of the BDCP or as part of an alternative plan if the BDCP is not completed.
- The question of how to deal with potential catastrophic failures in the Delta is also a concern for the Delta Plan. There needs to be a Finding that states this issue and the related need for an emergency action plan to deal with such failures.
- Issues related to subsidence need to be discussed, as it may not be possible to continue fixing the resulting problems.

Following Grindstaff's update regarding the status of the development of the Delta Plan, time was taken for discussion between the Delta ISB and Grindstaff.

- Wiens asked about the standards that would be used to define success of the BDCP and if the Delta ISB review of the Delta Plan should ignore the existence of the BDCP. Grindstaff replied that the BDCP will contain performance standards that will have to be

met and that the Delta ISB should assume that the BDCP will be implemented including implementation of an ecosystem restoration plan. However, the Delta Plan needs to specify the ecosystem restoration that will be needed. The Delta Plan will have to be reconciled to accommodate the BDCP which may result in re-opening the Delta Plan and modifying it to include the BDCP.

- Meyers, concerned about reducing the number of Findings located in the Ecosystem chapter, asked how concerned Grindstaff was about the certainty of the Findings, and whether or not the Findings should include a geographic component. Grindstaff indicated that he was not interested in reducing the number of Findings in the Ecosystem chapter but rather the large number contained in the remainder of the Delta Plan. With respect to the certainty of the Findings, Grindstaff would like a percentage of certainty assigned to each and indicated that he wants to understand what the status of the best science is today. A geographic component will be introduced using maps contained within the DFG's Ecosystem Restoration Plan.
- Atwater asked if each Finding listed was meant to be a problem statement with a related policy and action, what the policies and strategies will be to address the potential for earthquakes and the resultant effect on Delta levees, and noted that scientists should not be making recommendations regarding risk reduction, rather these should be made by civil engineers. Grindstaff replied saying that each Finding should be actionable, that a number of policies will be recommended to the Delta Council regarding earthquakes and their associated effects including those on infrastructure, and that he is comfortable with the engineering expertise they have consisting of Delta Plan staff and consultants.
- Healey commented that the Findings that address water have a geographic component outside as well as within the Delta but that the ecosystem Findings focus on the Delta and noted that successful restoration of the Delta should include actions outside of the Delta. He also stated that the Delta Plan should not specify restoration acreages, that levee reconstruction post a catastrophic event should be prioritized and asked about the definition of a "reliable water supply". Grindstaff replied that ecosystem restoration actions should be recommended outside the Delta as long as they benefit the Delta. With respect to restoration acreages, a range should be specified and indicated that discussion has been occurring regarding potential prioritization of levee reconstruction based on factors such as urbanization, as well as protection of the water supply and critical infrastructure. Hastings indicated that the Delta Plan does not include a definition of reliable water supply.
- Collier stated that in the first staff draft of the Delta Plan, one Finding essentially says that species *may* not survive; but that Grindstaff had verbally stated that there are species that *will* not survive. Collier pointed out that using 'will' instead of 'may' made the Finding much more actionable and edgy – and asked if the Council would be willing to state something like that? Grindstaff said yes if there was "best available science" that supported the statement.

- Mount noted that the Delta Plan does not appear to address the effect of catastrophic levee failure on water supply. Grindstaff replied that was not the intent and that policies would be included. He also noted that it is estimated that such a failure would affect water supply deliveries for approximately four months.
- Several members of the Delta ISB wanted to know more about the schedule for the release of various versions of the Delta Plan. Grindstaff explained that there will be seven total versions of the Delta Plan prior to adoption. The fifth version will actually be the version that the Draft EIR will be based on and has a target date of June 15 for release to the public.

4. General Discussion: First Staff Draft of the Delta Plan

Norgaard began this portion of the agenda by stating that he felt that the task that the Delta ISB was being asked to do in regards to review of the first staff draft of the Delta Plan was too policy driven and not truly science-based. He was also concerned about maintaining the independence of the Delta ISB as a review body. Several other members of the Delta ISB agreed with Norgaard. The discussion then transitioned to how the Delta ISB should focus their efforts in regard to review of the Delta Plan. The Delta ISB as a group agreed that their comments should be limited to guidance, not rewrites of sections of the Delta Plan. Members of the Delta ISB see their role in the development of the Delta Plan as strictly being that of oversight. Several members of the Delta ISB also recommended that they provide guidance regarding the use of good science (best available science) in support of Findings in the Plan.

It was also explained by Hastings that the prior versions of an independent science board (e.g., under CALFED) had the roles of insight, foresight and oversight, whereas, the current Delta ISB was only given the role of oversight through the Sacramento-San Joaquin Delta Reform Act of 2009. However, due to prior expectations developed from previous iterations of the science board, it is likely that there will be attempts to have the Delta ISB provide insight and foresight.

5. Presentations on Documenting Quality of the Science

The intended purpose of these presentations was to review methods for evaluating scientific certainty. Hastings presented information on the Delta Regional Ecosystem Restoration Plan (DRERIP), and Norgaard presented the Intergovernmental Panel on Climate Change (IPCC) and Millennium Ecosystem Assessment (MA) tools. Overview documents for all three programs were provided as handouts at the meeting.

a. Delta Regional Ecosystem Restoration Implementation Plan (DRERIP)

DRERIP focused on developing a science-based process that used a driver>linkage>outcome process and included three elements:

- Conceptual Models - linked conceptual models that compiled and synthesized the existing scientific understanding of Delta ecosystem function and the basic biology/life histories of key species;
- Action Evaluation Process – a standardized scientific evaluation process for evaluating worth, risk, reversibility and opportunity for learning of proposed ecosystem restoration actions; and
- Decision Support Tool – a decision tree to determine based on action evaluation results, whether and how to implement proposed restoration actions in the adaptive management framework.

Further, DRERIP developed an approach for scoring certainty, based on both an understanding of the system and predictability of the outcome (terms were defined).

The Delta ISB members discussed the DRERIP approach of assessing scientific certainty and commented that they had already suggested that the tools developed as part of DRERIP could be used in the development of the Delta Plan and that they should again recommend this as a means to evaluate scientific certainty within the Delta Plan. This process was used in the BDCP to evaluate many of the proposed actions.

b. Intergovernmental Panel on Climate Change (IPCC)

The IPPC considered all plausible sources of uncertainty using a systematic typology of uncertainty (typologies defined within a table). Previous estimates of ranges, distributions, or other measures of uncertainty and the extent to which they cover all plausible sources of uncertainty was also used. The Delta ISB members felt that this approach would not be applicable to the Delta Plan as the level of certainty needs to be 99 percent

c. Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment (MA) constantly recognizes uncertainty. The certainty of the action is the important criterion. The IPCC is moving towards using this method of assessment in their evaluation of climate change.

The MA adopted the following definition of uncertainty.

Uncertainty: An expression of the degree to which a future condition (e.g., of an ecosystem) is unknown. Uncertainty can result from lack of information or from disagreement about what is known or even knowable. It may have many types of sources, from quantifiable errors in the data to ambiguously defined terminology or uncertain projections of human behavior. (From the Millennium Ecosystem Assessment Framework Report Glossary 2003).

6. Break into small group work session(s)

Prior to breaking into small groups for a work session, the Delta ISB members went over specific chapters that were in the first staff draft of the Delta Plan. Chapters 5, 6, and 8 were specifically reviewed during the meeting, for which the lead role of review was assigned to Mount, Meyer and Atwater, respectively.

Chapter 5: "Ecosystem Restoration"

- The chapter would be helped greatly with definitions provided for the terms 'efficiency,' 'long-term,' and 'reliability.'
- Fact sheets provided for the Findings within this chapter were inconsistent with the narrative contained in the Findings within the Delta Plan.
- The use of statutes and plans prepared by other state agencies does not constitute scientific support.
- Findings were of various types (solutions, problem statements, policy statements, facts, etc.) and should be standardized as problem statements. This would provide clarity and consistency within the document.
- It needs to be made clear in this chapter and throughout the Delta Plan that climate change will have an effect in the Delta. The two statements that constitute the Finding regarding California's water supply do not connect to each other. In addition, this Finding should be incorporated into the first Finding. The Finding regarding surface and groundwater supplies is not accurate and should be rewritten. In addition, it is a solution rather than a problem statement. It should be rewritten to state that groundwater during a drought has x, y, z problems.
- In many instances adding graphics would greatly enhance the reader's understanding of the Finding.
- The Finding regarding water conservation should be rephrased as a problem statement. In addition, there is disagreement regarding whether or not agricultural water conservation really saves water.
- The Finding regarding the reuse of water is a solution statement and should be reworded as a problem statement.
- Other Findings that were provided as solution statements rather than problem statements, and therefore should be rewritten, included those addressing storage capacity, conveyance, and local storage programs.
- Finding regarding California's water supply facilities is redundant and the facts presented do not match the title provided.
- A reminder regarding the long-term droughts that California experiences should be added to the chapter.

Chapter 6: "Improve Water Quality"

- The focus of this chapter is on the aquatic system and does not include discussions of terrestrial systems and their impacts on water quality.
- Discussion of habitat effects, complexity and heterogeneity need to be more quantitative. The discussion of structural complexity should include how this leads to increased resilience. Introducing more complexity/connectivity will benefit native species.
- Focuses on the Delta area only, with no consideration of systems upstream or downstream from the Delta.
- Management strategies need to reflect that the Delta has irreversibly changed.
- 'Restoration' should be defined and the desired end goals specified.
- Historical ecology and how it relates to water quality was not included. Inclusion of a discussion could benefit the chapter.
- Explanation or definition of the phrase 'leverage historical features' is needed.
- Findings were of various types (solutions, problem statements, policy statements, facts, etc.) and should be standardized as problem statements. This would add clarity and consistency to the document.
- The Finding regarding permitting and obtaining project-specific permits is not a science issue but rather a governance issue. However, it is a significant issue and a discussion should be included throughout the Delta Plan. The Finding regarding survival of species should state that species will be "not likely" to survive. This will be due to land uses, climate change, loss of ecosystem structure and function, etc. Maintaining species requires a very large investment and in all probability, the resources simply will not be there to do what is necessary to maintain all of the species that will be in trouble.
- Lumping together municipal, industrial and agricultural discharges into one finding removes the ability to link the problem statement to an action. Development of a good loadings assessment and associated reduction plan are needed.
- Variability in salinities should be included.
- Link the Findings regarding flood management and floodplains in the Central Valley to the statute. As written, these two Findings are redundant.
- Why were levees and causeways not included with in-stream structures?
- The Finding regarding exotic plants species needs to be broader to encompass other types of invasive species. This topic is similar to climate change, in that it has far reaching implications.
- There is a substantial body of scientific literature regarding the harm that current flow regimes have on native species and it should be consulted.
- A discussion of hatcheries and upstream management should be included.

Chapter 8: "Protect and Enhance the Unique Cultural, Recreational, Natural Resources, and Agricultural Values of the California Delta as an Evolving Place"

- Comments from Atwater that applied to both the chapter and the Delta Plan overall:
  - The document needs to be reorganized in a way that allows it to flow more logically.
  - Organization should be structured around solutions.
- The title of the chapter, as well as the introductory text, does not reflect the coequal goals of the legislation (ecosystem sustainability is not mentioned).
- In discussion of emergency response for flooding, it is not stipulated or even discussed which islands in the Delta would be allowed to flood versus those that should be saved.
- There is already a state plan for emergencies; however, it does not address how to respond to a large earthquake event in the Delta.
- There needs to be more documentation to support the Finding regarding subsided Delta Islands being at the "highest risk."
- May want to include some discussion regarding the ecological consequences of leaving some islands flooded after an emergency event.
- Statement about the Delta being "flood prone" needs to be more precisely stated and should include some discussion about the effect of climate change on flood potential. There should be some discussion that distinguishes between the potential for a large quake from a major fault versus the potential from some of the "smaller" and lesser known faults that underlie the Delta.
- Again, Findings were of various types (solutions, problem statements, policy statements, facts, etc. and should be standardized as problem statements. This would provide clarity and consistency in the document.
- Climate change was not dealt with very effectively and there are other "stressors" that should have been discussed.

The members of the Delta ISB then divided into appropriate small groups to work on write-ups of their general comments as well as comments specific to individual chapters of the first staff draft of the Delta Plan.

7. Report out to larger group

After working in small groups on comments for the first staff draft of the Delta Plan, the Delta ISB members discussed a format for the comment letter. The Board decided that they would divide their comments into three parts: First, key messages/major concerns would be provided. Next, the second section would include overarching concerns and more generalized review comments noting that adaptive management needs to be included throughout the Delta Plan. This section of the comments would also note that illustrations should be provided, and relevant

literature cited. The third section of the memo would include detailed comments and suggestions on chapters 5, 6, 8, and 9.

8. Public Comment (For matters that were not on the agenda, but within the subject matter jurisdiction of the Delta ISB.)

There were no comments by any members of the public.

***Adjourned** at approximately 5:00 p.m.*

March 4, 2011 (8:30 a.m. – 3:00 p.m. PST)

1. Welcome

The meeting was called to order at 8:30 a.m., March 4, 2011 by the Chair of the Delta ISB, Dr. Richard Norgaard. Seven members of the Delta ISB were present: Brian Atwater, Tracy Collier, Michael Healey, Judy Meyer, Jeffrey Mount, Richard Norgaard, and John Wiens. One member was on the call for the meeting: Elizabeth Canuel. Vince Resh and Edward Houde were absent from the meeting.

2. Report out: Day 1 small group work sessions

This item was also covered on Day 1. Please see notes from Day 1, Item 7.

General comments were made by the Delta ISB and included the following. Overall it was agreed that the organization of the Delta Plan was weak, and it was suggested that the goals need to be better linked to the findings. Hastings explained that the Delta Plan's organization was centered around the goals and objectives. Atwater suggested that each chapter should begin with a statement as to how it relates to the goals and objectives of the Delta Plan, and then be clearly organized. The Board felt strongly that while the Plan needs to be better organized, it was not their role to specify how that should be done. Healey suggested that a table could be provided that showed the relationship among the Findings, Objectives and Goals.

Several of the Delta ISB members stated that the legislation mandates that the Delta Plan address the coequal goals of water supply and ecosystem sustainability, but this draft of the Plan does not address each goal within each chapter. The Board found that references were not adequately provided. Hastings stated that Dahm had provided some suggestions regarding appropriate references including The State of Bay Delta Science (2008), three recent reports from the Public Policy Institute of California regarding water supply, and the Pelagic Organism Decline report from the Interagency Ecological Program (Baxter et al. 2011).

It was also felt that the addition of graphics would greatly enhance the document. Graphics could have a theme or motif, such as variability, that is applied to issues such as precipitation, changes in fish stocks, etc.. It would also be important for these graphics to convey trends that occur within the system.

There was agreement that the Delta Plan does not acknowledge how highly variable the Delta system is. The Plan needs to recognize the complexity of spatial and temporal variation. The Board thought the Delta Plan would benefit from a chapter that specifically stated the state of the system, the state of the problems in the system, the state of the solutions to the problems, and a statement of how to adaptively manage the system. It was also discussed that adaptive management needs to be integrated throughout all elements of the Plan.

Several members asked how adaptive management will be used in the Delta Plan. Hastings stated that Council staff has expressed that adaptive management is only an issue of governance. However, Delta Science Program management continues to state that adaptive management needs to influence the entire Delta Plan.

Healey felt that for adaptive management to truly work it requires a great deal of trust in those that are implementing the adaptive management component of the Plan. Trust from the public, and from other agencies. Currently, that trust does not appear to exist although a more transparent process would help to build trust. Wiens stated that a Plan that fails to incorporate proactive adaptive management will not be consistent with the science. Various members discussed several projects where adaptive management was used and was successful in guiding those projects to a positive outcome and projects that did not incorporate adaptive management which resulted in the project potentially doing more harm than good.

Delta ISB members requested that at the April 7-8 meeting of the Delta ISB that there be an item on the agenda to discuss the Delta Plan with the authors of the plan.

Public comment on this agenda item provided by:
Amy Richie, Mosaic Associates, San Luis & Delta Mendota Water Authority: Richie asked if the Delta ISB plans to articulate an approach to evaluating the use of "best available science" within the Delta Plan.

3. Break into small group work session(s) to Prepare Draft Comments

The members of the Delta ISB divided into appropriate small groups to work on their general comments as well as comments specific to individual chapters of the first staff draft of the Delta Plan.

4. Report out to larger group and discuss Next Steps

This item was moved up one item on the agenda so that the Update on the Lead Scientist Recruitment item could be moved to after the lunch break, as item Number 5.

Norgaard stated that the key comments on the Delta Plan based on what was discussed in the workgroups appear to be: 1) that the Plan needs to recognize the high variability inherent in the system, and therefore needs an adaptive management component; 2) literature used as evidence needs to be cited throughout the document to provide strength to the statements; and 3) there needs to be a better use of graphics and illustrations to more clearly display scientific concepts and ideas.

5. Update: Lead Scientist Recruitment

Michelle Shouse, from the USGS, who is assisting with recruitment efforts by helping to develop a hiring mechanism through the USGS for the Lead Scientist position, reported to the Delta ISB on the status of this effort. Shouse explained that the process is not as far along as she had hoped it would be by this time. The individual originally assigned to work with Shouse on this suffered a significant personal loss. However, the recruitment effort is back on track although the USGS now has a hiring freeze in place. A waiver will have to be approved prior to advertising the position. Shouse also told the Board that the Lead Scientist position will be graded as a GS-15 level position, and that the questions for the exam component of the application process are now complete. The goal at this time is to have the position posted on USA Jobs by the end of March, 2011.

Several Delta ISB members agreed that the non-federal process should be initiated and that the interview panel and schedule should be identified now. Shouse agreed to find out if it is possible to send out the job description to non-USGS applicants prior to the position being advertised by the USGS.

6. Public Comment (For matters that were not on the agenda, but within the subject matter jurisdiction of the Delta ISB.)

Public comment on this agenda item provided by:
Connie Ford, representing Sacramento County Water Resources and self: Ford, representing the County, stated that the County's engineers do not feel that enough site specific analysis was completed to support the DRMS (California Department of Water Resources, Delta Risk Management Strategy) conclusions regarding seismic risk. Ford explained that the County's engineers believe that there will be a domino effect, such that once one levee wall goes others

will follow. Next, Ford representing herself, stated that the scientists and engineers working in the government sector are overworked and underfunded, and that improved analysis on these types of issues will occur only when the work situation is improved.

7. Preparation for next Delta ISB meeting and schedule meetings for June – December, 2011

Norgaard reviewed the schedule proposed for development of the comments on the first staff draft of the Delta Plan by the Delta ISB and all present agreed with the timeline presented in that schedule (see below). Future dates for Delta ISB meetings through July of 2011 were also set, those dates and times are listed below. The Delta ISB also agreed that they would like to have a status update on the BDCP presented to them at the May meeting.

ACTIVITY	WHO	DATE
Discuss First Staff Draft	Delta ISB	March 3
Begin Preparation Draft Review Comments	Delta ISB	March 4
Post on website – teleconference meeting notice and agenda	Science Program Staff	March 4
Finalize Draft Review Comments	Norgaard and Healey	March 8
Submit to Delta Science Program staff	Norgaard	March 8
Post draft comment letter on website	Science Program Staff	March 10
Delta ISB Teleconference to approve draft comments	Delta ISB	March 16 or 17
Prepare Final Review Comment Letter/Submit to Delta Science Program Staff	Norgaard and Healey	March 21: 10:00 a.m.
Post Final Review Comment Letter	Science Program Staff	March 23
Present Letter at Delta Stewardship Council Meeting	Need someone to fill in for Norgaard – Healey n/a	March 25

Dates and times for future meetings of Delta ISB:

Through July of 2011:

March 16, teleconference: 1-5p.m., PST
April 7-8: 8:30 a.m.-4:30 p.m., PDT
April 20, teleconference: 1:30 p.m.-4:30 p.m., PDT
May 5-6: 5/5 – 9:30 a.m.-4:30 p.m. and 5/6 – 9 a.m.-4:30 p.m., PDT
May 18, teleconference: 9 a.m.-12 p.m., PDT
June 2-3: 6/2 – 9:30 a.m.-4:30 p.m. and 6/3 – 9 a.m.-4:30 p.m., PDT
June 14, teleconference: 10 a.m.-1p.m., PDT
July 7-8: 7/7 – 9:30 a.m.-4:30 p.m. and 7/8 – 9 a.m.-4:30 p.m., PDT
July 20, teleconference: 10 a.m.–1 p.m., PDT

Adjourned *at approximately 3:00 p.m.*